CLAIMS

1. An optical information processing device comprising:

a multi-wavelength light source that emits light of two or more different wavelengths,

a filter portion that separates the light emitted from the multi-wavelength light source according to wavelength, and

a condensing lens that focuses a plurality of lights separated by the filter portion on the same point for multi-wavelength recording.

2. The optical information processing device according to claim 1, wherein the condensing lens focuses the plurality of lights separated by the filter portion on the same point via respectively different optical paths.

3. The optical information processing device according to claim 1, further comprising a polarizing filter for controlling the light of different wavelengths into light of respectively different polarizations.

4. The optical information processing device according to claim 1, wherein the multi-wavelength light source comprises a coherent light source that emits a fundamental wave and an optical wavelength conversion element for converting a portion of the fundamental wave emitted from the coherent light source into a higher harmonic wave, and emits light of two different wavelengths, which are the fundamental wave and the higher harmonic wave.

5. The optical information processing device according to claim 1, wherein the multi-wavelength light source comprises a semiconductor laser.

6. The optical information processing device according to claim 4, wherein:

the coherent light source is provided with a function of varying a wavelength of the emitted fundamental wave,

a conversion efficiency of the higher harmonic wave of the optical wavelength conversion element is changed by changing the wavelength

of the fundamental wave emitted from the coherent light source, and

an output ratio of the fundamental wave and the higher harmonic wave emitted from the multi-wavelength light source is controlled.

7. The optical information processing device according to claim 1, wherein the filter portion is an optical filter having a transmission characteristic that is dependent on a wavelength of light for at least one of transmittance, diffraction efficiency, and polarization, wherein the characteristic is not uniform within a surface of the optical filter.

8. The optical information processing device according to claim 1, wherein:

the filter portion is a ring-shaped band aperture filter, and

a transmission characteristic of a light is different in a ring-shaped band aperture portion of the ring-shaped band aperture filter and a portion other than the ring-shaped band aperture portion.

9. The optical information processing device according to claim 4, wherein:

the filter portion is a ring-shaped band aperture filter, and

only the fundamental wave penetrates the ring-shaped band aperture portion of the ring-shaped band aperture filter, and only the higher harmonic wave penetrates the portion other than the ring-shaped band aperture portion of the filter.

10. The optical information processing device according to claim 1, wherein:

a plurality of lights separated by the filter portion is focused on the same point in the recording medium,

the recording medium comprises a material wherein at least one of refractive index, absorption coefficient, and fluorescence characteristic changes by focusing the plurality of lights separated by the filter portion, and

information is recorded by focusing on the same point in the recording medium.

11. The optical information processing device according to claim 10,

wherein the recording medium is made from a plurality of recording layers.

12. The optical information processing device according to claim 10, wherein the recording medium is made of a single layer and locations in which the information is recorded are distributed in a thickness direction.

13. The optical information processing device according to claim 10, wherein the recording medium comprises a photochromic material.

14. The optical information processing device according to claim 4, wherein:

the fundamental wave and the higher harmonic wave are focused on the same point in a recording medium,

the recording medium is substantially transparent to the fundamental wave and the higher harmonic wave, and has a characteristic of being absorptive with respect to a sum frequency of the fundamental wave and the higher harmonic wave,

a wavelength of the sum frequency is given by $\lambda 1 \times \lambda 2/(\lambda 1 + \lambda 2)$ when the wavelength of the fundamental wave is $\lambda 1$ and the wavelength of the higher harmonic wave is $\lambda 2$, and

information is recorded by focusing on the same point in the recording medium.

15. The optical information processing device according to claim 14, wherein the recording medium is made from a plurality of recording layers.

16. The optical information processing device according to claim 14, wherein the recording medium is made of a single layer and locations in which the information is recorded are distributed in a thickness direction.

17. The optical information processing device according to claim 14, wherein the recording medium comprises a photochromic material.

18. A recording medium that records information using light, wherein:

the recording medium is substantially transparent with respect to two lights of different wavelengths,

information is recorded by a change of an optical characteristic only when the two lights are focused on the same point, and

a wavelength of one light of the two lights is 1/2 a wavelength of the other light.

19. The recording medium according to claim 18, wherein the recording medium comprises a photochromic material.

20. The recording medium according to claim 18, wherein the recording medium has a multilayer structure.

21. A recording medium that records information using light, wherein:

the recording medium is substantially transparent with respect to two lights of different wavelengths,

information is recorded by a change of an optical characteristic only when the two lights are focused on the same point,

the recording medium has a characteristic of being absorptive with respect to a sum frequency of the two lights, and

a wavelength of the sum frequency is given by $\lambda 1 \times \lambda 2/(\lambda 1 + \lambda 2)$, where the wavelength of one of the lights is $\lambda 1$ and the wavelength of the other light is $\lambda 2$.

22. The recording medium according to claim 21, wherein the recording medium comprises a photochromic material.

23. The recording medium according to claim 21, wherein the recording medium has a multilayer structure.